

# NOTES

## SLEEP-RELATED RESPIRATORY DISEASE

### GENERALLY, WHAT IS IT?

#### **PATHOLOGY & CAUSES**

- Impaired capacity to breathe

#### **SIGNS & SYMPTOMS**

- Apneic episodes (variable duration); fatigue; hypoxemia; hypercapnia

#### **DIAGNOSIS**

#### **OTHER DIAGNOSTICS**

##### **Polysomnography**

- Measure sleep patterns, rapid eye movements (REM), tonicity of neck muscles,

snoring, airflow, end tidal CO<sub>2</sub>, oxygen saturation, cardiac rhythm, body positioning

- *Electroencephalography*: sleep pattern
- *Electrooculography*: REM
- *Electromyography*: neck muscle tonicity
- *Electrocardiography*: heart rhythm
- *Video monitoring*: body positioning

#### **TREATMENT**

#### **OTHER INTERVENTIONS**

- Supportive, lifestyle modification

## APNEA OF PREMATURITY

[osms.it/apnea-of-prematurity](https://osms.it/apnea-of-prematurity)

#### **PATHOLOGY & CAUSES**

- Most common cause of apnea in preterm neonates
- Developmental disorder associated with decreased responsiveness to carbon dioxide
- Respiratory pauses of  $\geq 20$  seconds/shorter pause with bradycardia ( $< 100$ /minute), cyanosis, pallor, oxygen desaturation in neonates  $< 37$  weeks gestational age (GA)

#### **CAUSES**

- Immaturity of fetal brain areas responsible for breathing
- Incidence increases with degree of prematurity
  - Most neonates  $< 28$  weeks GA
  - $> 1/2$  neonates 28–36 weeks GA

#### **SIGNS & SYMPTOMS**

- Apneic episodes  $\geq 20$  seconds in first 72 hours post-birth
  - Frequency increases 14–21 days post-birth

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- Bradycardia
- Hypoxemia

## DIAGNOSIS

### OTHER DIAGNOSTICS

- Monitor premature neonates
  - Cardiorespiratory monitors, pulse oximetry
- Exclude other causes for apnea
  - Metabolic disorders, neurological disorders, infections, antepartum drugs (e.g. opiates)

## TREATMENT

- Resolves spontaneously after 37 weeks postmenstrual age
  - Postmenstrual age = postnatal age + GA age

### MEDICATIONS

- Methylxanthines
  - Improve sensitivity to carbon dioxide, increase ventilations/minute, decrease periodic breathing events

### OTHER INTERVENTIONS

- Nasal CPAP

# SLEEP APNEA

[osms.it/sleep-apnea](https://osms.it/sleep-apnea)

## PATHOLOGY & CAUSES

- **Irregular breathing patterns**, shallow breathing and snoring during sleep.
- **Apnea**: momentary: pause in breathing
- Can last several seconds to several minutes
- More than **five episodes an hour** must occur
- **Hypopnea**: abnormally shallow breathing event

second apnea → individual wakes from sleep

- Most common form of sleep apnea; peripheral problem; **obstruction at oropharynx**

## CAUSES

### Obstructive sleep apnea

- **Obesity** (most common)
- Hypertrophic adenoid glands/palatine tonsils
- Micrognathia (small chin, AKA underbite)
- Sedatives (excessive muscle relaxation—alcohol, sleeping pills)
- Allergies
- Hypothyroidism (obesity, less muscle tone)

## TYPES

### Central sleep apnea

- Sudden **failure of brain respiratory center's** generation of spontaneous breathing efforts
- Damage to brain respiratory centers → ↑ respiratory drive → hyperventilation → CO<sub>2</sub> (hypocapnia) → apnea → ↑ ↑ CO<sub>2</sub> (hypercapnia) → ↑ respiratory drive → hyperventilation
- Associated with **Cheyne–Stokes respiration**

## RISK FACTORS

- More common in individuals who are biologically male
- Incidence increases with age

### Obstructive sleep apnea

- Intermittent airway obstruction → 20–30

## COMPLICATIONS

### Obstructive sleep apnea

- Systemic hypertension
- Diabetes
- Anginal chest pain, arrhythmias, heart failure
- Pulmonary hypertension, cor pulmonale, respiratory failure

## SIGNS & SYMPTOMS

- Sleep deprivation, excessive daytime fatigue
- Headache, difficulty concentrating
- Morning headaches

### Central sleep apnea

- Nocturia
- Stress-induced insomnia
- Nocturnal anginal chest pain

### Obstructive sleep apnea

- Loud snoring
- Hypopnea
- Repeated arousals from sleep
- Decreased libido

## DIAGNOSIS

### OTHER DIAGNOSTICS

- Polysomnography

## TREATMENT

### MEDICATIONS

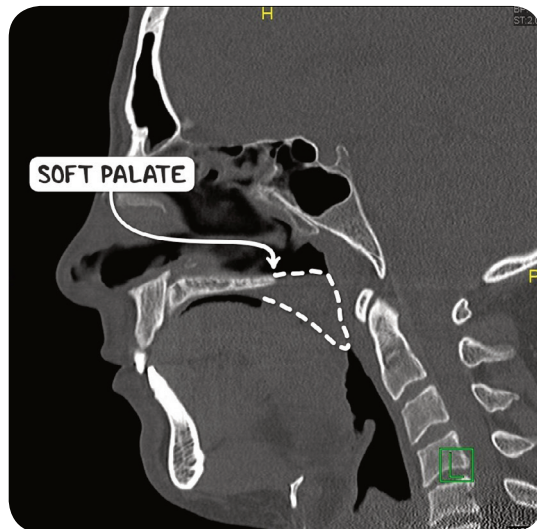
- *Central sleep apnea*: respiratory stimulants (acetazolamide, theophylline)

### SURGERY

- *Obstructive sleep apnea*: micrognathia, hypertrophic adenoids/tonsils

### OTHER INTERVENTIONS

- *Continuous positive airway pressure (CPAP)*
- *Central sleep apnea*: supplemental oxygen during sleep
- *Obstructive sleep apnea*: custom mouthpieces, weight loss



**Figure 132.1** A CT scan of the head and neck in the sagittal plane. The soft palate is elongated, thickened and abutts the posterior pharynx, leading to obstructive sleep apnea.